CLAIMS

What is claimed is:

1   1.   A method for marking data packets from a source comprising the
2   steps of:
3   determining a sending rate estimate, s; and
4 *check*   marking a packet to one of a plurality of priority levels based on
   ATM
5 *using*   the sending rate estimate, s.
   "ABR"
      cpn cells

1   2.   The method of claim 1 wherein the step of marking comprises the
2   steps of:
3   determining if the sending rate estimate is less than a first rate
4   threshold; and
5   in response to a determination that the sending rate estimate is
6   less than the first rate threshold, setting a probability of marking
7   at least one data packet with a first selected priority level to a
8   first value, wherein said first selected priority level is one of a
9   plurality of priority levels.

1   3.   The method of claim 2 further comprising the step of:
2   in response to a determination that the s is less than the first rate
3   threshold, incrementing a burst size.

1   4.   The method of claim 1 wherein the step of marking comprises the
2   steps of:
3   determining if the sending rate estimate is between a first rate
4   threshold (FRT) and a second rate threshold; and

5   in response to a determination that the sending rate estimate is
6   between a first rate threshold and a second rate threshold,
7   setting a probability of marking a data packet with a subordinate
8   priority level based on s.

1   5.   The method of claim 1 wherein the step of marking comprises the
2   steps of:

3   determining if the sending rate estimate is between a first rate

4   threshold (FRT) and a second rate threshold; and

5   in response to a determination that the sending rate estimate is

6   between a first rate threshold and a second rate threshold,

7   marking a data packet such that a rate of packets marked a

8   subordinate priority level is no greater than 1 - (FRT/s).

1   6.   The method of claim 1 wherein the step of marking comprises the

2   steps of:

3   determining if the sending rate estimate is above a second rate

4   threshold (SRT); and

5   in response to a determination that the sending rate estimate is

6   above the SRT, marking the packet such that a rate of packets

7   marked the second priority level is at least (SRT - FRT)/s.

1   7.   The method of claim 6 further comprises the step of:

2   in response to a determination that the sending rate is above

3   the SRT, marking the packet such that a rate of packets marked

4   a lowest priority level is at least (s-SRT)/s.

5

1   8.   The method of claim 1 further comprising the steps of:

2   determining if the sending rate estimate is greater than a rate

3   threshold;

4   in response to a determination that the sending rate estimate is

5   greater than the rate threshold, determining if a burst size is

6   greater than a minimum burst; and

7   in response to a determination that the burst size is greater than

8   a minimum burst, marking the packet a first priority level.

1   9.   The method of claim 8 further comprising the step of:

2   in response to a determination that the burst size is greater than

3   the minimum burst, decrementing the burst size.

1   10.   The method of claim 1 further comprising the steps of:

2   determining if the sending rate estimate is greater than a super

3   rate threshold;

4   in response to a determination that the sending rate estimate is

5   greater than the super rate threshold, determining if a burst size

6   is greater than a minimum burst; and

7   in response to a determination that the burst size is greater than

8   a minimum burst, marking the packet a priority level based on a

9   count of packets marked a highest priority level during a period.

1   11.   The method of claim 10 further comprising the step of:

2   in response to a determination that the burst size is greater than

3   the minimum burst, decrementing the burst size.

1   12.   An apparatus for marking data packets from a source comprising:

2   a means for determining a sending rate estimate, s; and

3   a means for marking a packet to one of a plurality of priority

4   levels based on the sending rate estimate, s.

1   13.   The apparatus of claim 12 wherein the means for marking

2 comprises:

3   a means for determining if the sending rate estimate is less

4   than a first rate threshold; and

5   a means for setting a probability of marking at least one data

6   packet with a first selected priority level to a first value, said

7   means responsive to a determination that the sending rate

8   estimate is less than the first rate threshold, wherein said first

9   selected priority level is one of a plurality of priority level.

1   14.   The apparatus of claim 13 further comprises:

2   a means for incrementing a burst size, in response to a

3   determination that the s is less than the first rate threshold.

15. The apparatus of claim 12 wherein the means for marking comprises:

> a means for determining if the sending rate estimate is between a first rate threshold (FRT) and a second rate threshold; and

> a means for setting a probability of marking a data packet with a subordinate priority level based on s, said means responsive to a determination that the sending rate estimate is between a first rate threshold and a second rate threshold.

16. The apparatus of claim 12 wherein the means for marking comprises:

> a means for determining if the sending rate estimate is between a first rate threshold (FRT) and a second rate threshold; and

> a means for marking a data packet such that a rate of packets marked a subordinate priority level is no greater than $1 - (FRT/s)$ in response to a determination that the sending rate estimate is between a first rate threshold and a second rate threshold.

17. The apparatus of claim 12 wherein the means for marking comprises:

> a means for determining if the sending rate estimate is above a second rate threshold (SRT); and

> a means for marking the packet such that a rate of packets marked the second priority level is at least $(SRT - FRT)/s$, in response to a determination that the sending rate estimate is above the SRT.

18. The apparatus of claim 17 further comprises:

> a means for marking the packet such that a rate of packets marked a lowest priority level is at least $(s-SRT)/s$, in response to a determination that the sending rate is above the SRT.

1   19.   The apparatus of claim 12 further comprises:

2   a means for determining if the sending rate estimate is greater

3   than a rate threshold;

4   a means for determining if a burst size is greater than a

5   minimum burst, in response to a determination that the sending

6   rate estimate is greater than the rate threshold; and

7   a means for marking the packet a first priority level, in response

8   to a determination that the burst size is greater than a minimum

9   burst.

1   20.   The apparatus of claim 19 further comprises:

2   a means for decrementing the burst size, in response to a

3   determination that the burst size is greater than the minimum

4   burst.

1   21.   The apparatus of claim 12 further comprises:

2   a means for determining if the sending rate estimate is greater

3   than a super rate threshold;

4   a means for determining if a burst size is greater than a minimum

5   burst, in response to a determination that the sending rate

6   estimate is greater than the super rate threshold; and

              a means for marking the packet a priority level based on a count

              of packets marked a highest priority level during a period, in

              response to a determination that the burst size is greater than a

              minimum burst.

1   22.   The apparatus of claim 21 further comprising:

2   a means for decrementing the burst size, in response to a

3   determination that the burst size is greater than the minimum

4   burst.

1   23.   A method to determine probabilities for marking a packet a priority

2   level comprising the steps of:

3   determining a first probability;

4   determining at least one second probability; and

5   weighting each probability so that each probability contributes to

6   a net probability.